User's Guide for the Interactive RadioEpidemiological Program (NIOSH-IREP)

Designed for use by the Department of Labor in adjudicating claims under the Energy Employees' Occupational Illness Compensation Program Act (EEOICPA)

Version 5.2

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NIOSH National Institute for Occupational Safety and Health

SENES Oak Ridge Inc. Center for Risk Analysis

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1.0   BACKGROUND

Under the Energy Employees' Occupational Illness Compensation Program Act (EEOICPA), the National Institute for Occupational Safety and Health (NIOSH) is charged with the development of guidelines to determine whether a claimant's cancer meets the criterion for causation by workplace exposure to ionizing radiation (i.e., a 50% or greater probability of causation).

The basis for this determination, as specified in EEOICPA, is the set of radioepidemiological tables developed by a National Institutes of Health (NIH) working group in 1985. These radioepidemiological tables serve as a reference tool providing probability of causation (PC) estimates for individuals with cancer who were exposed to ionizing radiation.

A major technological change accompanying the most recent update to the 1985 radioepidemiological tables represents a scientific as well as a practical improvement: the development of a computer program for calculating probability of causation. This software program, named the Interactive RadioEpidemiological Program (IREP), allows the user to apply the National Cancer Institute's (NCI) risk models directly to data about exposure for an individual employee. This makes it possible to calculate the probability of causation using better quantitative methods than could be incorporated into printed tables. In particular, IREP allows the user to take into account uncertainty concerning the information being used to estimate individualized exposure and to calculate the probability of causation.

Accounting for uncertainty is important because it can have a large effect on the probability of causation estimates for a specific individual. The Department of Veterans Affairs (VA), in their application of the 1985 radioepidemiological tables, uses the value at the upper 99 percent credibility limit of the probability of causation estimate. Similarly, as required by EEOICPA, the U.S. Department of Labor (DOL) will use the upper 99 percent credibility limit to determine whether the cancers of employees were caused by their radiation doses. This will help minimize the possibility of denying compensation to claimants under EEOICPA for those employees with cancers likely to have been caused by occupational radiation exposures.

A version of IREP has been developed to specifically address the workforce covered by EEOIPCA. This version, called NIOSH-IREP, is tailored to the risks and radiation exposures characteristic of energy employees. NIOSH-IREP will be used by DOL to calculate the probability of causation for each claim.

INTRODUCTION

The NIOSH-IREP computer code is a web-based program that estimates the probability that an employee's cancer was caused by his or her individual radiation dose. Personal information (e.g., birth year, year of cancer diagnosis, gender) and exposure information (e.g., exposure year, dose) may be entered manually or through the use of an input file. For application by the U.S. Department of Labor (DOL), the input file option will be used to preset all personal information, exposure information, and system variables. These input file(s) will be created by NIOSH for each individual claim and transmitted to the appropriate DOL district office for processing.

The purpose of this user's guide is to provide DOL with a concise step-by-step guide to the use of NIOSH-IREP in processing energy employee compensation claims.

A glossary containing definitions of radiation terms and other frequently used terms related to NIOSH-IREP is included in Section 6.0 of this user's guide. Readers interested in a more thorough discussion of the science behind NIOSH-IREP are encouraged to review the Technical Documentation and similar documents posted on NIOSH's Office of Compensation Analysis and Support (OCAS) web site at www.cdc.gov/NIOSH/OCAS.

A 3.5-inch floppy disk containing example input files is attached to the back cover of this report. These files are to be used in conjunction with this user's guide to demonstrate the use of NIOSH-IREP. Section 7.0 describes the input files and provides pre-calculated solutions for each case.

DETERMINING PROBABILITY OF CAUSATION

STEP 1: Log onto NIOSH-IREP

NIOSH-IREP can be accessed through NIOSH's Office of Compensation Analysis and Support (OCAS) web site at:

http:// www.cdc.gov/niosh/ocas/ocasirep.html

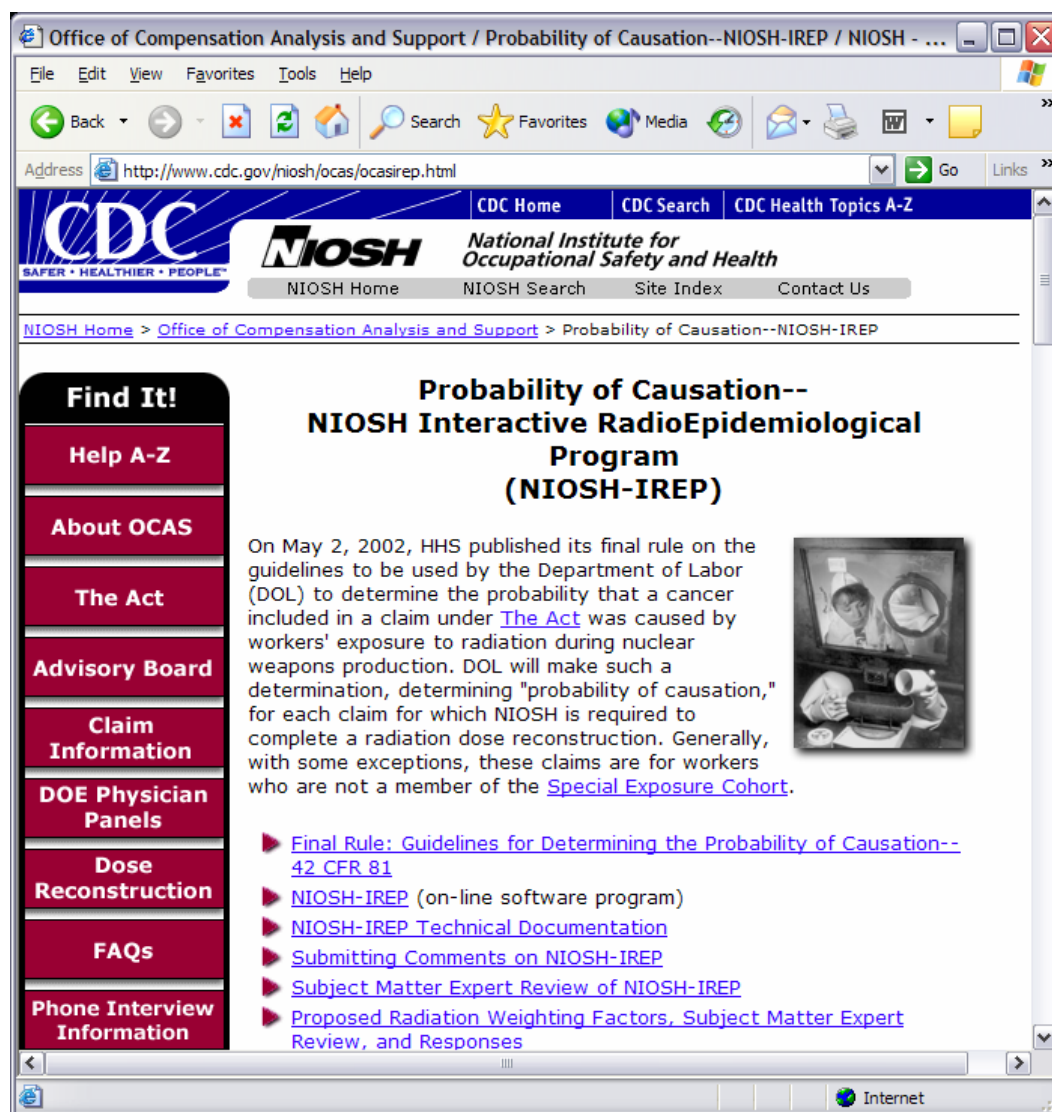Click on the bullet entitled "NIOSH-IREP (on-line software program)."

Figure 1. NIOSH web page containing the link to NIOSH-IREP

STEP 2: Start Program

On the initial log-in screen (Figure 2), select the option "To begin by using a NIOSH-provided input file" to start NIOSH-IREP.
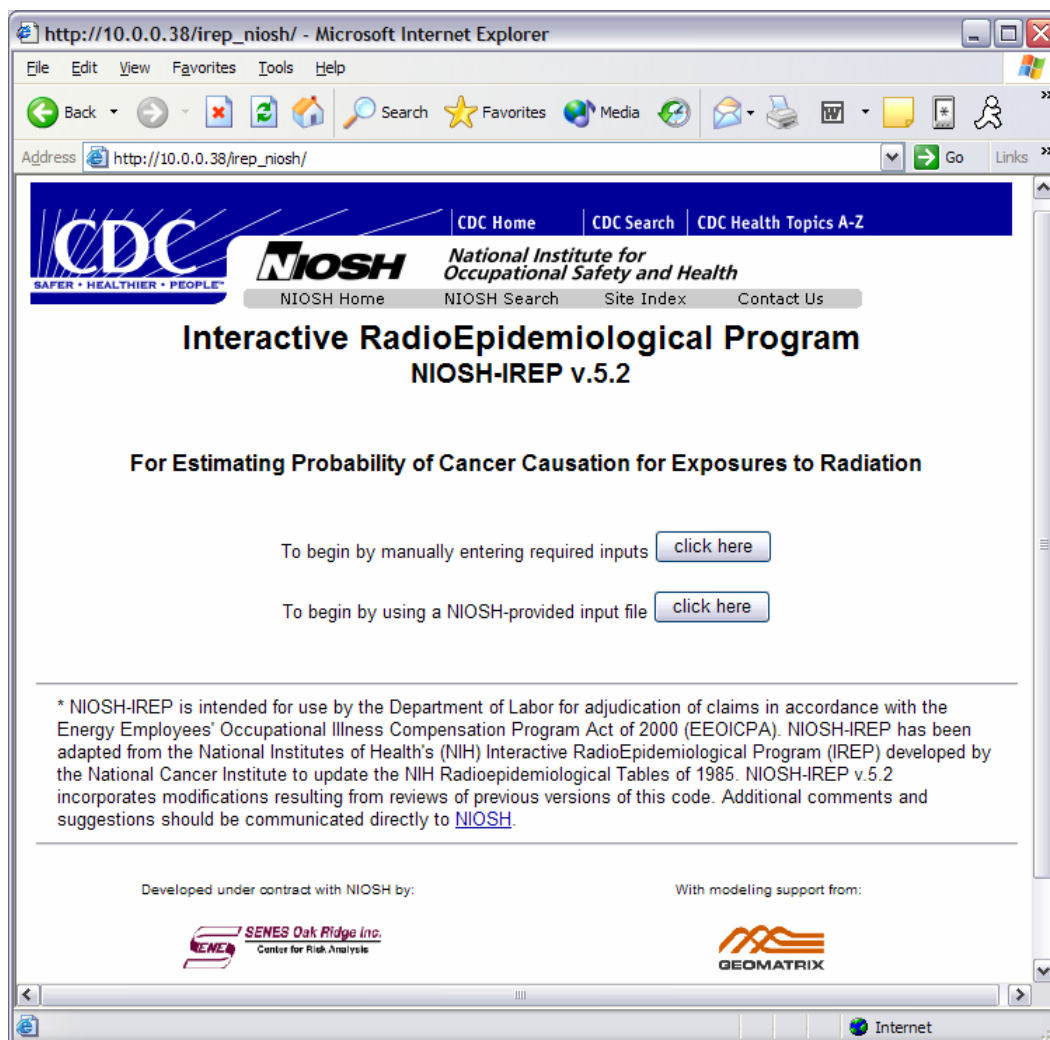
Figure 2. Initial log-in screen of the NIOSH-IREP computer program

NOTE: This screen allows a user to choose to enter personal information (e.g., birth year, year of cancer diagnosis, gender) and exposure information (e.g., exposure year, dose) manually (click on top button) or through the use of an input file (bottom button.)

As specified by 42 CFR Part 81 (Guidelines for Determining the Probability of Causation), DOL will use the data input file option to preset all personal information, exposure information, and system variables. This input file will be created by NIOSH, as specified by 42 CFR Part 82 (Methods for Radiation Dose Reconstruction), and transmitted to the appropriate DOL District Office for processing.

STEP 3: Upload Claimant Input File

A. The first step of uploading a claimant input file is to identify where the file resides. Click the "Browse" button on the screen shown in Figure 3.

B. Locate the input file in the "Choose file" dialog box (Figure 4). Once the input file is selected, click the "Open" button to upload it.

C. The file and path will appear beside the "Browse" button (Figure 5). Click "Upload File."

D. A status message will appear, including the name of the uploaded file (Figure 6). Click "Continue" to populate the fields of the main input screen (as shown in Figure 7, next page) with the values saved in the input file.
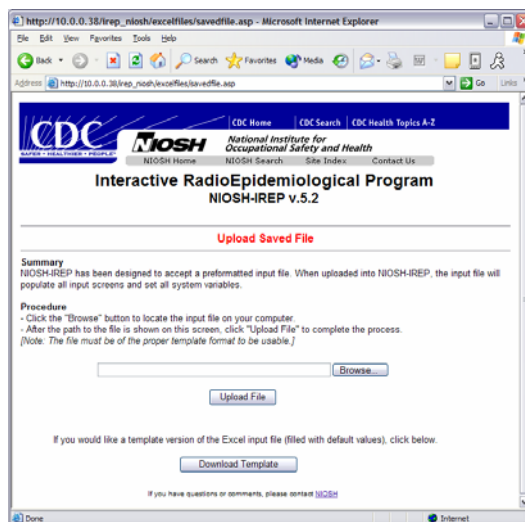
Figure 3. "Upload Saved File" screen
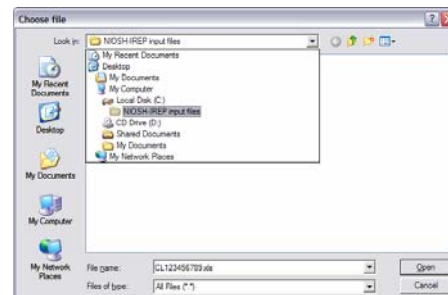
Figure 4. "Choose file" dialog box
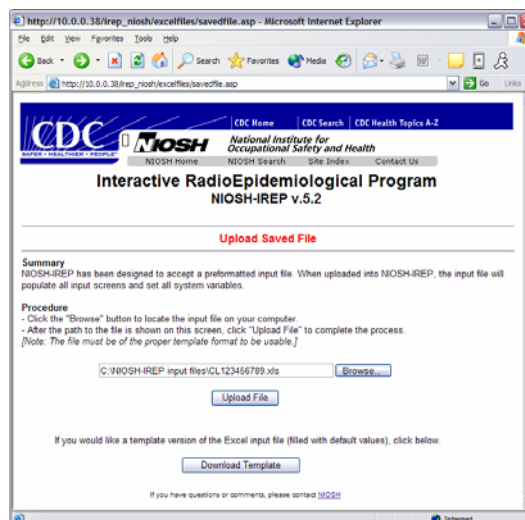
Figure 5. Choose file dialog box
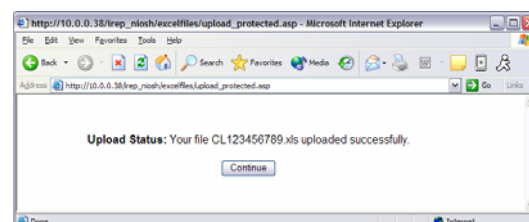
Figure 6. Success!

STEP 4: Perform Calculation

To calculate probability of causation, click the "Generate Results" button on the main input screen (Figure 7).

The claimant's information will be sent to the server that hosts NIOSH-IREP. The calculation will be performed in real-time, and the results will be returned in the form of a summary table suitable for printing and saving (Figure 8, next page).

Figure 7. Main input screen

Figure 8. NIOSH-IREP Summary Report

STEP 5: Print and Save Output Summary Report

To Print:

When the calculation is completed, the output summary report can be printed by using the "Print" command in the "File" menu.

To Save:

An electronic copy of the output summary report can be saved using the "Save As" command in the "File" menu.

In the "Save Web Page" dialog window, name the file and select the location where the file is to be saved.

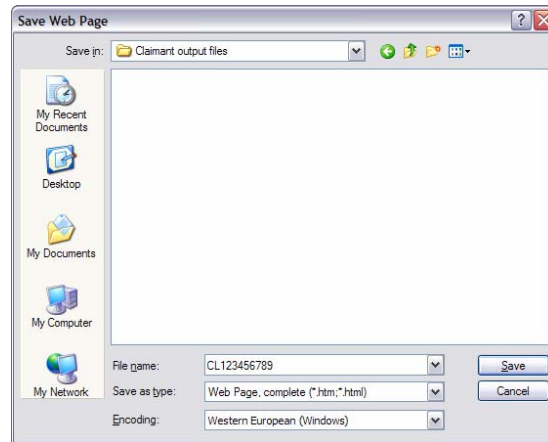*[NOTE: Select "Web Page: complete" from the "Save as type" pull-down menu]*

Figure 9. "Save Web Page" dialog window

STEP 6: Perform Additional Calculations (if necessary)

There are several circumstances in which DOL will need to perform additional calculations for a given claimant. When additional calculations are required, NIOSH will prepare a separate input file for each cancer model that is to be run in NIOSH-IREP. NIOSH will change the "Should alt model be run?" field in each input file from the default "No" to "Yes." This question is displayed on the main input screen (Figure 10). If the answer is "Yes", at least one additional NIOSH-IREP run will be necessary.

If a new run is required, click the "New Calculation" button at the bottom of the NIOSH-IREP Summary Report (Figure 8, Page 9) and upload the next input file.

Note: In cases where the upper 99 percent credibility limit of the probability of causation is equal to or greater than 45% but less than 50%, using the default simulation sample size of 2000, it will <u>not</u> be necessary for DOL to perform additional calculations. For these claims, NIOSH will increase the sample size to 10,000, choose a new random number seed, and preset these new parameters to the input file that is sent to DOL.

File Naming Convention

File names for multiple input files will adhere to the following naming convention: NIOSH will add an underscore and sequential letter of the alphabet to the end of the file name. For example, if a claim originating from DOL's Cleveland District Office has 3 input files, the file names might be CL123456789_A, CL123456789_B, and CL123456789_C. (If there is only 1 input file, the file name would be CL123456789.)

The scenarios requiring additional calculations include:

A. Multiple primary cancers

If a claimant is diagnosed with more than one primary cancer, NIOSH will provide an input file for each primary cancer. NIOSH-IREP should be run with each of the input files. Enter the results from each run into the "Multiple Primary Cancers" calculator. The Multiple Primary Cancers calculator is accessible by clicking the button located at the bottom of the main input screen (Figure 10).

Figure 10. Main Input Screen showing the "Multiple Primary Cancer" button